CLAIMS

I claim:

1. A method for determining position in a fluid pipeline, comprising the following steps:

(a) providing a pipe tool including a radio frequency transmitter and receiver;

(b) further providing recording means for recording signals received by the receiver;

(c) further providing a plurality of radio identification devices for resonating and transmitting responses to the receiver of the radio frequency transmitter, when the radio identification devices receive a signal from the radio frequency transmitter;

(d) installing the radio identification devices in the pipeline, at predetermined intervals thereamong;

(e) passing the pipe tool through the pipeline;

(f) sequentially triggering a response from each of the radio identification devices within by means of the transmitter of the pipe tool, as the pipe tool with its transmitter passes each of the radio identification devices in the pipeline; and

(g) recording the responses of the radio identification devices using the recording means.

2. The method according to claim 1, including the steps of:

(a) providing a plurality of joints along the pipeline; and

(b) installing one of the radio identification devices at each of the joints of the pipeline.

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3. The method according to claim 2, including the steps of:

(a) installing each of the radio identification devices in a resilient O-ring; and

(b) installing an O-ring having one of the radio identification devices therein, at each of the joints of the pipeline.

4. The method according to claim 1, including the steps of:

(a) providing a closed antenna loop for each of the radio identification devices;

(b) encircling the radio identification device by wrapping a portion of the antenna loop therearound;

(c) dimensioning the antenna loop for fitting closely within the circumference of the pipeline; and

(d) installing the antenna loop and radio identification device encircled thereby, within the pipeline.

5. The method according to claim 1, including the steps of:

(a) providing a plurality of radio frequency transparent sleeves configured for closely fitting within the pipeline;

(b) installing one of the radio identification devices within each of the sleeves; and

(c) installing each of the radio identification device equipped sleeves within the pipeline, at predetermined intervals thereamong.

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6. The method according to claim 1, including the steps of:

(a) providing a plurality of radio frequency transparent sleeves configured for closely fitting within the pipeline;

(b) further providing a closed antenna loop for each of the radio identification devices;

(c) dimensioning each antenna loop for fitting closely within the circumference of a corresponding one of the sleeves;

(d) encircling each of the radio identification devices with a corresponding antenna loop;

(e) installing one of the antenna loops and radio identification devices encircled thereby, within each of the sleeves; and

(f) installing the sleeves with their radio identification devices and antenna loops, at predetermined locations within the pipeline.

7. The method according to claim 1, wherein the step of recording the responses of the radio identification devices using the recording means further includes the steps of:

(a) installing the recording means at a location remote from the pipe tool;

(b) providing a communication line between the recording means and the pipe tool; and

(c) transmitting the responses to the remotely located recording means by means of the communication line.

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8. The method according to claim 1, wherein the step of recording the responses of the radio identification devices using the recording means further includes the steps of:

(a) installing the recording means within the pipe tool;

(b) recovering the pipe tool from the pipeline; and

(c) downloading the responses from the recording means of the pipe tool.

9. The method according to claim 1, including the step of providing battery electrical power for each of the radio identification devices.

10. The method according to claim 1, including the steps of:

(a) providing first and second electrochemically reactive dissimilar metals within the pipeline, for each of the radio identification devices;

(b) electrically connecting the first and second dissimilar metals to the radio identification devices;

(c) separating the first and second dissimilar metals by providing flow of the fluid within the pipeline, therebetween; and

(d) utilizing electrolytic properties of the fluid for electrochemically generating electrical power for the radio identification devices by means of the first and second dissimilar metals electrically connected thereto, and the fluid disposed therebetween.

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11. An apparatus for determining position in a fluid pipeline, comprising:

a pipe tool for passing through the pipeline, said pipe tool including a radio frequency transmitter and receiver;

recording means for recording signals received by said receiver; and

a plurality of radio identification devices disposed within the pipeline at predetermined intervals thereamong, for resonating and transmitting responses to said receiver of said radio frequency transmitter when said radio identification devices receive a signal from said radio frequency transmitter as said transmitter is passed through the pipeline.

12. The apparatus according to claim 11 wherein the pipeline includes a plurality of evenly spaced joints thereamong, including a resilient O-ring installed at each of said joints with each said O-ring including one of said radio identification devices disposed therein.

13. The apparatus according to claim 12, including a closed circular antenna loop disposed within each said O-ring with each said antenna loop encircling one of said radio identification devices.

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14. The apparatus according to claim 11 wherein the pipeline includes a plurality of joints thereamong, including a closed circular antenna loop disposed circumferentially within the pipeline at each of the joints with each said antenna loop encircling one of said radio identification devices.

15. The apparatus according to claim 11, including a plurality of radio frequency transparent sleeves for installing in the pipeline at predetermined intervals and closely fitting within the pipeline, with each of said sleeves including one of said radio identification devices disposed therein.

16. The apparatus according to claim 15, including a closed circular antenna loop disposed circumferentially within each of said sleeves with each said antenna loop encircling said one of said radio identification devices disposed within each of said sleeves.

17. The apparatus according to claim 11, wherein said recording means comprises a data recording device externally disposed to the pipeline tool and to the pipeline, and including a communication line extending between the pipe tool and said recording means.

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18. The apparatus according to claim 11, wherein said recording means comprises a data recording device disposed within the pipeline tool, for downloading data from said data recording device after the pipe tool with said data recording device is recovered from the pipeline.

19. The apparatus according to claim 11, wherein said radio identification devices are active devices requiring electrical power with each of said devices including an electrical battery therewith.

20. The apparatus according to claim 11, wherein:

said radio identification devices are active devices requiring electrical power;

each of said radio identification devices includes a first and a second electrochemically reactive dissimilar metal electrically connected thereto; and

each said dissimilar metal being separated from one another by the fluid within the pipeline for electrochemically generating electrical power for said each of said radio identification devices by means of electrolytic properties of the fluid and corresponding electrochemical reactions with said first and said second dissimilar metal.